

DIVISION OF ENVIRONMENT  
QUALITY MANAGEMENT PLAN

PART III:

SURFACE MINING PROGRAMS  
QUALITY ASSURANCE MANAGEMENT PLAN

Revision 1  
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Kansas Department of Health and Environment  
Division of Environment  
Bureau of Environmental Remediation  
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## **Section 1**

### **INTRODUCTION**

#### **1.1     Purpose of Plan**

This document presents the quality assurance management plan for the Surface Mining Programs. The plan describes the mission, developmental history, organizational structure, environmental monitoring protocols, data handling procedures, and quality assurance (QA) and quality control (QC) requirements of these programs. Standard operating procedures (SOPs) and equipment used in the programs are presented in the appendices of the plan.

#### **1.2     Plan Revisions**

To be effective and useable, this document must be maintained in an up-to-date condition. As required by the Division of Environment Quality Management Plan (Part I, section 7), the contents of the plan are reviewed on at least an annual basis. Minor changes in the report's organizational structure or terminology may be approved by the Section Chief. However, major revisions which substantially change the contents of the document, especially in terms of QA policies or procedures, require the added approval of the Bureau QA Representative and the Bureau Director.

## Section 2

### DESCRIPTION OF PLAN

#### 2.1 Historical Overview

On July 1, 1988, the Kansas Department of Health and Environment was given jurisdiction and authority to implement the Mined-Land Conservation and Reclamation Act, Kansas Statute Annotated (K.S.A.) 49-401 et. seq. The Bureau of Remediation, Surface Mining Section (SMS) currently administers this Act. The SMS consists of the Kansas Abandoned Mine Land Program (AML), the Emergency Program, and the Administration and Enforcement (A&E) Program.

The AML Program was established by K.S.A. 49-428 in 1979 pursuant to the Surface Mining Control and Reclamation Act of 1977 (SMCRA, Public Law 95-87). The objective of the AML Program is the protection of the public health, safety, general welfare, and property from the extreme danger and/or adverse effects of past coal mining practices. A secondary objective of the program is the restoration of land, water resources and the environment previously degraded as a result of the adverse effects of past coal mining practices. Eligible lands under the AML Program are those lands mined and left abandoned, or lands inadequately reclaimed, prior to the enactment of SMCRA on August 03, 1977.

Kansas currently has 350 abandoned coal mine sites identified as health, safety, and general welfare problems on the AML Inventory. The current projected cost to reclaim the Priority 1 & 2 problems on the Kansas Inventory is more than 232 million dollars. This figure does not include the costs for reclamation of the numerous environmental restoration projects in Kansas. Current federal policy is to abate all health, safety, general welfare problems (Priority 1 & 2 on the State Inventory) before Priority 3 environmental projects are initiated. The majority of the AML problems are high walls in close proximity to public roads and areas prone to subsidence activity. Highwall problems are usually alleviated by partially or completely backfilling the pits to eliminate the hazard. The SMS also deals with capping abandoned underground coal mine shafts, extinguishing mine fires, and filling dangerous impoundments.

The A&E portion of the program regulates the active coal mines in the State. This part of the program was established by the Mined Land Conservation and Reclamation Act, Kansas Statute Annotated 49-401 et. seq. in 1969. The regulation of a coal mine begins with the submission of a detailed permit application. Once the permit application has been approved and a performance bond is posted, the operator can begin mining according to the permit document and the performance standards in Kansas Administrative Regulations Chapter 47-9-1. The mine will be inspected by staff members of the SMS at least monthly during its entire life to insure compliance with permit conditions and regulations. The permit will remain bonded until the operator has met the performance standards of the regulations, including revegetation requirements. The SMS will engineer, inspect, and administer any reclamation done under bond forfeiture should the coal operator be unable to meet their reclamation obligation to the State. Kansas also operates the Emergency Program which responds to past coal mining problems that create such an extreme danger to life and/or property, normal AML abatement procedures cannot handle them quickly enough. Since most of the past mining occurred in the Pittsburg-Frontenac, Kansas area, the operation of the Emergency Program from that location facilitates and improves response times.

The SMS operates the Emergency Program from Frontenac, Kansas since most of the past underground mining activity occurred in that area. These problem events are sudden, unforeseen occurrences and are usually the result of abandoned underground coal mine roofs collapsing, causing the ground surface to subside.

Generally the subsidences occur as vertical openings (cave-ins) at the ground surface and can result in settlement and property damage to homes and other structures, such as streets and roads. They also create extreme hazards to pedestrians, vehicles using the roads, and the general public walking in yards or on sidewalks. The SMS typically excavates the sinkholes in streets and yards with a backhoe and fills the area with suitable materials. When subsidences are causing structural damage to homes and other buildings, a drilling project is undertaken. Holes are drilled from the surface to the mine voids beneath the structure and all voids are filled with a cement grout to support the structure and minimize additional settlement and damage.

## 2.2 Mission and Goals

In compliance with the rules and regulations promulgated by the legislature, the Mine Land Program is dedicated to the reclamation of active coal mines and the lands of the State adversely affected by past coal mining practices. These rules and regulations are contained in K.A.R. 47-1-1 et. seq. The implementation of the program is managed through the permitting process; design review and development for AML Projects and active mines under bond forfeitures; inspection of active mines, AML Projects and Emergency Projects; environmental and engineering permit processing; sample collection; bond releases; and right-of-entry procurement. The Declaration of Policy for the SMS can be found in K.S.A. 49-402.

The goals of the Mine Land Program are as follows:

- (1) Develop and/or review engineering plans and specifications for reclamation projects which provide the most cost effective long term remediation of hazards associated with past coal mining practices.
- (2) Aid coal operators in the procedures for permitting. This includes conducting meetings prior to permit submission to determine baseline monitoring for geology, hydrology, land uses, and vegetation.
- (3) Conduct investigations of reported emergency problems within 24 hours of their being reported to the SMS Offices. These investigations determine if the alleged emergency is coal mine related, and therefore eligible to be handled under the Emergency Program.
- (4) Obtain public input into the Mine Land Program through public comment periods during the grant processes, in the promulgation of regulations, and prior to issuance of coal mining permits.
- (5) Collect surface and ground water samples to determine water quality for obtaining environmental permits of different types, developing cumulative hydrologic impact

assessments for the active coal mines, and obtaining evidence for hearings on violations of coal mining regulations. Develop methodologies and guidelines for sampling geology and revegetation success for the active coal mines.

- (6) Review for completeness and technical adequacy all coal mining and reclamation permits received by the SMS.
- (7) Conduct inspections daily during the construction of AML projects to ensure the contractor's compliance with plans and specifications for the project. Inspections are conducted monthly until the reclamation project becomes stable, then quarterly until the project reaches an adequate vegetative and aesthetic state so that the control of the land can be given back to the landowner.
- (8) Conduct a minimum of one partial inspection per month and one complete inspection per quarter on each coal mining permit in the State. These inspections are conducted to confirm the operator is conducting mining operations in compliance with regulations and permit requirements.
- (9) Conduct inspections daily during the construction of emergency reclamation projects to ensure the contractor's compliance with plans and specifications for the project.
- (10) Ensure that the coal operators have reclaimed the land in compliance with regulations and permit requirements. This includes, but is not limited to, the review of revegetation data in both the office and field. This data is submitted by the coal operator in conjunction with a Phased bond releases.
- (11) Upon bond forfeiture, reclaim coal mining permits in compliance with the reclamation plans detailed in the permit document. This includes preparing engineering designs, letting the bids for reclamation, inspecting the on-going reclamation, and performing all acts necessary for the administration of the reclamation.
- (12) Prepare responses and program amendments to inquiries during the oversight process by the Federal Office of Surface Mining Reclamation and Enforcement (OSM).
- (13) Prepare responses to requests and inquiries made by the general public and landowners concerning reclamation or operations on active coal mines.

## 2.3 Organization and Responsibilities

### ORGANIZATIONAL CHART

(See Exhibit)

The Bureau Manager's responsibilities are defined in Part II of the Bureau Quality Assurance Plan.

The Section Chief supervises and coordinates with the Unit Supervisors to ensure the efficient and effective operation of the program. The Section Chief also administers the Mine Land Program by organizing, directing, planning, and supervising the activities of the program. This includes, but is not limited to, directing the budget and grant preparation; authoring regulations for promulgation; acting as a liaison between the OSM and the State; preparing Secretary Orders; meeting with coal operators, landowners, and the general public; and handling personnel matters as they arise.

The Program Services Unit (PSU) Supervisor is responsible for the coordination of all types of permit reviews by pulling together the inspection, engineering, and program services personnel responsible for each portion of a surface mining and reclamation permit application. The PSU Supervisor reviews the different disciplines necessary for the type of permit review and assigns tasks as required to ensure that a timely, thorough, and effective review is completed. The PSU Supervisor is responsible for coordinating and supervising the Project Managers for AML Projects. The PSU is also responsible for obtaining required environmental permits prior to reclamation on AML projects and bond forfeited areas.

The Inspection Unit Supervisor is responsible for the coordination of inspection duties by planning, assigning, coordinating, evaluating, and supervising the activities of the Environmental Technician level positions in the Unit to ensure the efficient utilization of staff time and talent to assure meeting program objectives. The Inspection Unit Supervisor makes sure the SMS remains in compliance with the regulations governing inspection frequency by the effective allocation of staff and resources. The Inspection Unit is also responsible for conducting inspections for bond releases, and during reclamation on bond forfeited areas and AML Projects, to ensure compliance with the plans and specifications for the work.

The Engineering Unit Supervisor is responsible for coordinating and supervising the engineering staff in their review of permit documents, bond releases, and the development of bond amounts. The Engineering Unit is also responsible for the development of detailed engineering plans and specifications for the reclamation of bond forfeited areas and AML Projects, as well as the review of AML projects designed by consulting engineering firms.

The Administrative Support Unit Supervisor is responsible for the documentation and archiving of records within the Mine Land Program. The Administrative Support staff is responsible for tracking and filing all aspects of the program. They are also responsible for the day to day activities which keep the SMS functioning in a smooth and efficient manner.

SMS staff are responsible for the regulatory oversight of the active coal mines in the state, the remediation of AML hazards and the remediation of AML hazards meeting the criteria for emergency abatement. The individual staff of the SMS are responsible for one or more of the following functions:

- (1) Review permit applications to determine completeness, technical adequacy and compliance with all regulations governing the permitting of coal mines. Communicate effectively with operators in order to resolve any permit deficiencies.



- (2) Developing and maintaining cumulative hydrologic impact assessments for each of the main watersheds where active mining is occurring. This includes collecting surface and ground water samples to determine quality and quantity of the water in the hydrologic impact area.
- (3) Inspect coal mining permits to insure compliance with all applicable state regulations by using knowledge of surface mining regulations and operations. This includes preparing fully documented inspection reports and submitting them to OSM within 14 days of the inspection. Write notice of violations and cessation orders when violations of regulations are encountered.
- (4) Investigate landowner inquiries and citizen complaints in order to assess their validity by inspecting the site and collecting data to determine if a violation of the regulations exist. These inquiries and complaints are reviewed and documentation is submitted as outlined by regulations.
- (5) Compile documentation, information, and evidence for testimony in hearings and/or court appearances for disputes relating to mining violations.
- (6) Calculate performance bonds required for reclamation activities and recommend permit bonding levels to the Section Chief in order to ensure that adequate reclamation funds are available in the event of bond forfeiture.
- (7) Compile, collect, and/or investigate information submitted for bond releases. Aid in collecting and organizing data to develop technical guidelines for the active mining operations in the state
- (8) Develop and maintain guidelines for baseline overburden sampling and determining the success of revegetation.
- (9) Review Abandoned Mine Land and bond forfeiture reclamation contracts, plans and specifications for field detail, the ability to be constructed, and clarity of the designs.
- (10) Evaluate, maintain, and rank abandoned mine land problem areas using the matrix and techniques developed by the Surface Mining Section, which must comply with all State and Federal laws.
- (11) Provide recommendations for design and construction of abandoned mine land projects to the Section Chief by providing the necessary input for evaluation and ranking of abandoned mine land sites, developing a scope of work, preparing environmental statements and categorical exclusions, obtaining rights of entry and lien determinations, and compiling contract documents.
- (12) Collaborate in the management of abandoned mine land projects from design through construction including the preparation and review of contracts, addendums, change orders, plans, and specifications to ensure program objectives are met.

- (13) Inspect construction activities on Abandoned Mine Land projects to insure compliance with plans and specifications, and to determine project success and/or maintenance needs.
- (14) Collaborate in the development and design of drawings and plans for abandoned mine land reclamation projects by land surveying, computer mapping, geotechnical testing, earthwork computation, and developing bid documents and specifications to ensure project completion in the most cost effective and environmentally sound manner.
- (15) Review maps, plans, specifications, and bid documents prepared by engineering consultants for abandoned mine land reclamation projects to ensure their feasibility, accuracy, and compliance with State and Federal regulations.
- (16) Coordinate abandoned mine land projects by serving as project manager. This includes handling the administration of the project from conception through construction.
- (17) Obtain, collect, and compile permits from all types of Federal, State, and local agencies necessary to complete abandoned mine land reclamation projects. This includes taking surface and ground water samples to determine water quality on the project site and in the receiving system.
- (18) Coordinate and oversee construction activities on Emergency Program projects by counseling construction contractors and inspecting project sites to ensure compliance with plans and to accomplish program goals.
- (19) Investigate reports of potential mine related emergencies to determine if they are mine related problems and if emergency criteria are met, using knowledge of emergency program guidelines.
- (20) Attend training sessions provided by OSM and other agencies and organizations to insure staff's regulatory, administrative, and technical capabilities are as up-to-date as possible for performing the tasks required.
- (21) Perform other tasks as required to achieve the goals and objectives of the Surface Mining Section.

### Section 3

#### QUALITY ASSURANCE / CONTROL POLICY STATEMENT

It is the policy of the SMS to strive for the highest level of quality control in both engineering design and environmental sampling. The coal operators and engineering consultants used by the SMS are responsible for QA/QC on both their engineering designs and environmental sampling. The coal operators have to meet the SMS's guidelines for geologic sampling, both lithological and geochemical, and success of revegetation. The coal operator is required to submit in the geologic portion of their permit application a quality control plan, which includes procedures, certifications, and qualifications from the testing laboratory. The coal company is also required to keep split samples for the SMS and one out of every three cores must be analyzed by the selected testing lab and a different quality control laboratory. Their surface and groundwater sampling has to be done using methodologies and procedures contained in the 15th Edition of "Standard Methods for the Examination of Water and Wastewater" at a KDHE certified laboratory. QA/QC for the revegetation of the A&E portion of the Mine Land Program are done according to the SMS and OSM approved document "Revegetation Standards for Success and Statistically Valid Sampling Techniques for Measuring Revegetation Success."

Surface and groundwater sampling done by the SMS is conducted according to KDHE's Standard Operating Procedures (SOP) BER-01 and BER-02, found in Appendix A. The samples are then sent to either the KDHE lab or a KDHE certified lab for testing. Soil and spoil samples collected for routine lime, phosphorus, potassium, and nitrogen requirements will be collected using KDHE's SOP BER-03 for soils and sediment. The testing for these parameters will be done using Natural Resources Conservation Service, formerly Soil Conservation Service, techniques and procedures at KDHE approved labs. Any environmental sampling with the potential for legal action will include SOP BER-19 for chain of custody. It will be the policy of the SMS that all environmental sampling done by this office will be conducted to meet the following:

- (1) All sampling conducted by or for the SMS will be done in a manner to best utilize the resources at hand. During the planning phase, prior to sample collection, all factors involved in sample collection will be reviewed to ensure a quality product. This will include detailing what will need to be done to ensure that the objectives of the program are met.
- (2) All sample collection will be performed in compliance with the Bureau's and Division's QA/QC plan and SOP's whenever possible. If a SOP's does not cover a particular circumstance the SMS will develop one which will.
- (3) SMS supervisory personnel are responsible for the periodic review of QA/QC procedures to make sure they still meet the objectives of the program. Any deficiencies with the plan will be identified and corrected.
- (4) The SMS staff will strive to produce the most environmentally sound sampling program. This program will strive to meet as many of the objectives of other programs as practical so the information obtained by sampling can be shared with other agencies both within and outside of KDHE.

## Section 4

### QUALITY ASSURANCE/CONTROL CRITERIA AND PROCEDURES

#### 4.1 Field Station Site Selection

The selection of sampling locations is based on several factors including type and purpose of the sample, representativeness, accessibility (permission to sample), location in relation to existing mining areas and location of potential target areas. Selection criteria vary depending upon the type of medium being sampled and the purpose of the sampling which are described in site-specific Quality Assurance Project Plans (QAPP's).

#### 4.2 Field Equipment Installation

Generally field staff will use non-dedicated sampling equipment that is either disposable or reusable. Sampling equipment designated for reuse must be decontaminated as specified in SOP BER-05.

#### 4.3 Sampling Types

The staff of the SMS will most of the time collect independent environmental samples. However, at times splits or duplicate samples may be obtained from coal operators and consulting firms. Surface water is the most frequently collected media, but groundwater, spoil, soil, and vegetation may also be sampled at times.

The samples collected by SMS staff will be obtained using KDHE approved standard operating procedures (SOP's), such as: BER-01 for collecting ground water, BER-03 for the collection of soil, BER-02 for the collection of surface water, and BER-19 for the chain of custody.

#### 4.4 Safety Considerations

Field and laboratory staff that participate in environmental programs encounter potentially dangerous situations on a frequent basis. In addition to the routine possibility of automobile or equipment accidents, employees may encounter extremely slippery surfaces, toxic or hazardous substances, infectious microorganisms, fire or electrocution hazards, vicious dogs, belligerent persons, or other threatening situations. Injuries or illnesses resulting from such situations may lead to substantial human suffering and, from a QA/QC perspective, deprive programs of the services of a valuable employee for an extended period of time.

Although it is not possible to predict every conceivable risk that may arise during the course of work, supervisors must ensure that those risks faced by staff on a recurring basis are addressed in the SOPs and are discussed during employee training. Field and laboratory staff are expected to abide by the safety protocols contained within the QA management plans and SOPs and to integrate safety considerations into all aspects of their work. Field staff should follow SOPs BER-18 and BER-20. BER routinely budgets for ongoing safety training expenses and annual medical physicals for field staff associated with monitoring and/or field inspections of hazardous materials (refer to BER-17).

Nonsupervisory employees are expected to bring potentially unsafe practices or situations to the attention of their program manager. In turn, the program manager shall evaluate the practice or situation and either take the appropriate corrective action or, in complicated circumstances, seek the advice of the appropriate Section Chief or higher level supervisor. Major corrective actions those warranting changes in an SOP shall be implemented by staff only upon approval of the Section Chief, and Bureau Manager.

#### 4.5 Requesting Analytical Services

The majority of the water samples collected will be submitted to the Kansas Health and Environmental Laboratory (KHEL) for testing. A few others will be sent to KDHE certified testing facilities. These labs will have QA/QC plans in place through the certification process. Other samples such as spoil or soil samples will also be sent to KDHE certified labs for testing. The samples for soil amendments will be sent to the Kansas State University, Extension Service to be tested for lime, phosphorus, potassium, and nitrogen.

#### 4.6 Procedures for Assessing Data Precision, Accuracy, Representativeness and Comparability

##### 4.6.1 Ongoing Quality Assurance Review and Special Audits

The Section Chief and Unit Supervisors will be responsible for the review and evaluation of QA/QC practices and procedures. The Section Chief, after consultation with each of the Unit Supervisors, is the responsible party for the development and implementation of any new procedures which may correct problems with the existing QA/QC plan. Each of the Unit Supervisors will be responsible for monitoring quality control procedures in their respective units. This monitoring will include tracking quality control procedures and correcting any deficiencies which may be identified. The Section Chief will report any changes in quality control procedures to the Bureau Manager.

##### 4.6.2 Equipment Calibration and Maintenance

Staff of the SMS will be responsible for the calibration and maintenance of all SMS field and lab equipment directly utilized by the staff member. The equipment will be used and maintained in conformance with the manufacturer's recommendations and procedural manuals. The staff member will check the instruments for proper operation and calibrate the equipment according to manufacturers recommendations and specifications prior to use. Any malfunctions or problems associated with the use of the equipment will be reported to the appropriate supervisor at the earliest opportunity. The supervisor will report the problem to the Section Chief and arrange for the equipment to be sent to the manufacturer for repair prior to its next use.

##### 4.6.3 Quality Control Blanks and Spikes

Quality control procedures must be taken by field staff to ensure the integrity of all samples collected. Without checks on the sampling and analytical procedures, the potential exists for contradictory or incorrect results being reported. Procedures describing quality control samples are defined in BER-12 or are included in specific SOPs.

#### 4.7 Corrective Action Procedures

In the context of quality assurance (QA), Mine Land Program corrective actions are procedures that may be implemented on environmental samples that do not meet predetermined QA specifications. In general, the corrective action procedures program address any cause triggering a negative finding in association with QA/QC procedures or results and identifies the appropriate corrective actions necessary to address it. SMS staff are responsible for reviewing data validation reports, including reports of non-compliances with any QA/QC procedures, to identify significant or repetitious conditions adverse to quality, or deficiencies regarding the implementation or adherence to required quality assurance practices. In addition, the SMS staff is required to investigate the source of the problem and are responsible for defining and/or implementing the necessary actions to remedy the problem.

The quality characteristics of data generated by sampling, monitoring, or analyzing, is defined in the following items:

Accuracy: The degree of agreement of a measurement, or an average of measurements of the same thing,  $X$ , with an accepted reference or true value,  $T$ , usually expressed as the difference between the two values,  $X-T$ , or the differences as a percentage of the reference or true value,  $100(X - T)/T$ , and sometimes expressed as a ratio,  $X/T$ . Accuracy is a measure of the bias inherent in the system.

Precision: A measure of mutual agreement among individual measurements of the same property, usually under prescribed similar conditions. Precision is best expressed in terms of the standard deviation. Various measures of precision exist depending on the prescribed similar conditions.

Completeness: A measure of the amount of the valid data obtained from a measurement system, compared with the amount that was expected to be obtained under correct normal conditions, and that was needed to be obtained in meeting the project data quality objectives.

Representativeness: The degree to which data accurately and precisely represent a characteristic of population, the parameter variations at a sampling point, a process condition, or an environmental condition. It also includes how well the sampling point represents the actual parameter variations that are under study.

Comparability: The confidence with which one data set can be compared with another; a qualitative characteristic that must be assured in terms of sampling, analysis, reporting, etc.

The exact values of the quality characteristics will vary depending upon the analytical processes and procedures employed. Site-specific work plans will detail the recommended field activities, and analytical methodologies necessary to establish the appropriate data quality characteristics. Corrective actions may include re-sampling, reanalyzing samples, or reviewing laboratory procedures.

#### 4.8 Data Management

Data reported to the SMS will be validated by verifying the methodologies for sample collection and preparation, testing methodologies and procedures, and by tracking sample collection in field logs or by other Unit Supervisor approved methods. Reports should be presented in a clear and concise manner that are easily understood. Reports should include any equations used to determine concentrations of parameters tested. All data presented and reports filed should contain enough information to support the methodologies used in the study. Chain of custody information should also be presented at the time of data reporting and validation.

#### 4.9 Quality Assurance/Control Reporting Procedures

Reports submitted to the SMS by contracting company's should include a QA/QC status summary. The status summary should contain methodologies and procedures used to perform the tests, data accuracy, any problems with QA or QC and procedures to rectify the problems.